IN THE DRAWINGS

Please replace sheets 1 and 2 of the drawings with the enclosed replacement sheets of drawings.

REMARKS

With the present response, Applicant proposes to amend the drawings, the specification, and claims 1 and 3-7.

In the outstanding Office Action, the Examiner (1) objected to the drawings, (2) objected to claims 4-7, (3) objected to the specification, (4) rejected claims 1, 2, and 8 under 35 U.S.C. §102(b) as being anticipated by Kowshik et al., U.S. Patent No. 5,625,544, and (5) rejected claim 8 under 35 U.S.C. §103(a) as being unpatentable over Kowshik.

With regard to the objection in (1), the Examiner objected to the blank boxes in FIG. 1 and requested that FIGS. 2-9 should be designated by a legend such as "Prior Art" because only that which is old is illustrated. Applicant has submitted new drawing sheets in accordance with the Examiner's recommendations. Specifically, in FIG. 1, boxes 21 and 22 have been labeled with "Voltage Multiplier" and box 23 has been labeled with "Controlling Circuit". These changes are supported by, e.g., page 6, lines 7-30 of Applicant's specification. Applicant has also placed "Prior Art" on FIGS. 2-9. Applicant respectfully requests the objection to the drawings to be withdrawn.

Regarding the objections in (2), the Examiner objected to claims 4-7 under 37 C.F.R. §1.75(c) as being in improper form due to multiple dependent claim 3. The Examiner did not examine claims 4-7 on the merits due to the multiple dependency.

Applicant respectfully disagrees. On October 22, 2003, contemporaneously with the filing of the application, Applicant filed a Preliminary Amendment to remove the multiple dependency. According to the PAIR system, the Preliminary Amendment was entered on October 22, 2003 (the filing date of the application). Applicant also encloses a copy of the originally filed Preliminary Amendment and the postcard for the same. Consequently, claims 4-7 should have been examined on the merits.

Nonetheless, Applicant has assumed that the current claims are the claims filed in the application and not the claims as amended by the Preliminary Amendment.

Applicant has performed in this response the same amendment performed in the Preliminary Amendment. Namely, amended claims 3-7 have been amended to remove the multiple dependencies.

Furthermore, dependent claims 3, 6, and 7 have been amended to correct minor misnaming errors. For instance, in dependent claim 3, the "switching capacitor multiplier (21)" has been amended to be the "switching capacitor circuit (21)", as recited in independent claim 1. Dependent claim 5 has been amended to clarify that "the output of the switching capacitor circuit (21) is not coupled via a diode to the output terminal (32) of the multiplier" (emphasis added) as shown in FIGS. 1 and 11 of the present disclosure.

As the amendment to dependent claims 3-7 were not made for patentability purposes, these claims should receive the full range of equivalents. Applicant respectfully requests the objection to claims 4-7 be withdrawn.

As to the objection in (3), the Examiner objected to the title as being non-descriptive. Applicant has changed the title to be "VOLTAGE MULTIPLIER WITH CHARGE RECOVERY" (emphasis added), as described for example at page 5, lines 6-14 and page 7, lines 20-25. Applicant respectfully submits the replacement title is descriptive and requests the objection to the title be withdrawn.

With regard to the rejections in (4), Applicant has amended independent claim 1 to clarify that the switching capacitor circuit (21) and the diode chain circuit (22) are each coupled between the input (31) and output (32) terminals of the multiplier. In other words, as shown in FIGS. 1 and 11, these circuits (21) and (22) are coupled in parallel between the input (31) and output (32) terminals of the multiplier. Such amendments are supported, e.g., by FIGS. 1 and 11, and by and page 6, line 5 to page 7, line 25 of Applicant's specification.

Applicant reads Kowshik as providing charge pump circuits having an output stage in series with "N stages of diode-capacitor voltage multipliers clocked so as to convert a low voltage received from a supply voltage to a high voltage at an output terminal thereof

employs an output stage to improve the efficiency of the charge pump. The output stage includes first and second legs each coupled to the output terminal, where the first leg provides current to the output terminal during low transitions of the clock signal and the second stage provides current to the output terminal during high transitions of the clock signal." Kowshik at col. 1, lines 50-60. That the output stage is serially coupled to the stages of diode-capacitor voltage multipliers can be seen in FIGS. 2 and 2A of Kowshik.

Kowshik does allow charge pump circuits to be implemented in parallel. See FIGS. 3 and 3A of Kowshik and col. 3, lines 35-53. Specifically, Kowshik states that "[w]here it is desired to generate even greater currents to output terminal V_{pp}, a plurality of circuits 200 may be connected in parallel, where each of circuits 200 receives its own clock signal and an associated high-transition non-overlapping clock signal." Col. 3, lines 35-39 of Kowshik.

However, none of the circuits shown and described in Kowshik discloses or implies a capacitive voltage multiplier comprising a switching capacitor circuit (21) and a diode chain circuit (22), each of which is coupled between input (31) and output (32) terminals of the multiplier, as recited in independent claim 1.

Therefore, Applicant respectfully submits that independent claim 1 is patentable over Kowshik. Because independent claim 1 is patentable, dependent claims 2-4 and 6-8 are also patentable for at least the reasons give above with respect to independent claim 1.

Moreover, amended dependent claim 5 states that the "output of the switching capacitor circuit (21) is not coupled via a diode to the output terminal (32) of the multiplier" (emphasis added). As seen in FIGS. 1 and 11 of Applicant's specification, the output of the switching capacitor circuit (21) is not coupled to the output terminal (32) of the multiplier through a diode. As disclosed by Applicant, an intended use of an exemplary embodiment is for displays, where the not insignificant parasitic capacitance 103 of the display itself contains a charge too, which will also be recovered when using an exemplary embodiment of the

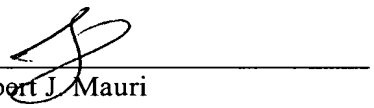
present disclosure. See page 5, lines 6-14 of the present disclosure. By contrast, Kowshik discloses that diodes are connected, as part of the output stage 204, between the output V_{pp} and capacitors (e.g., C_A-C_C and/or C_1-C_N) of the charge pump circuit.

Consequently, dependent claim 5 in combination with the features of independent claim 1 is further patentable over Kowshik, regardless of the patentability of independent claim 1 from which dependent claim 5 depends.

Regarding the rejection in (5), because independent claim 1 is patentable, dependent claim 3 is also patentable for at least the reasons give above with respect to independent claim 1.

Based on the foregoing arguments, it should be apparent that claims 1-8 are thus allowable over the reference(s) cited by the Examiner, and the Examiner is respectfully requested to reconsider and remove the rejections.

Respectfully submitted:



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